



Tessellated™  
TILE FACTORY

# Case Study

## Simple & complex tessellation



TTF has developed an intensive analysis on complex and simple geometry in tessellation and the different levels of aesthetic appeal in relation to geometry in residential and commercial environments. We develop the best tessellated tile solutions for your design projects and offer point of design assistance.

Tessellated tiles has a strong association with Australian architecture, particularly during the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. They were a popular feature in a variety of architectural styles during this period, contributing to the distinctive character of many Australian homes and public buildings.

Tessellated tiles are closely linked with the Federation architecture of Australia, which prevailed from the 1890s to around 1915. Federation homes were characterised by their ornate detailing, asymmetrical designs, and a combination of various architectural styles, including Queen Anne, arts and crafts and Edwardian influences. Tessellated tiles were often used in verandas, entrance pathways, and hallways of Federation houses. They played a significant role in adding a decorative and visually appealing element to the exterior and interior spaces.

Tessellation refers to the geometric tiling of a plane with one or more shapes, called tiles, without any overlaps or gaps. Tessellation can be categorised into two main types: simple tessellations and complex tessellations.

### Simple Tessellation:

#### 1. Regular shapes

Simple tessellations involve regular shapes with equal sides and angles. Examples include squares, equilateral triangles, and hexagons.

#### 2. Repeating patterns:

The tiles in simple tessellations create repeating, regular patterns when arranged together. These patterns are uniform and predictable.

#### 3. Ease of construction:

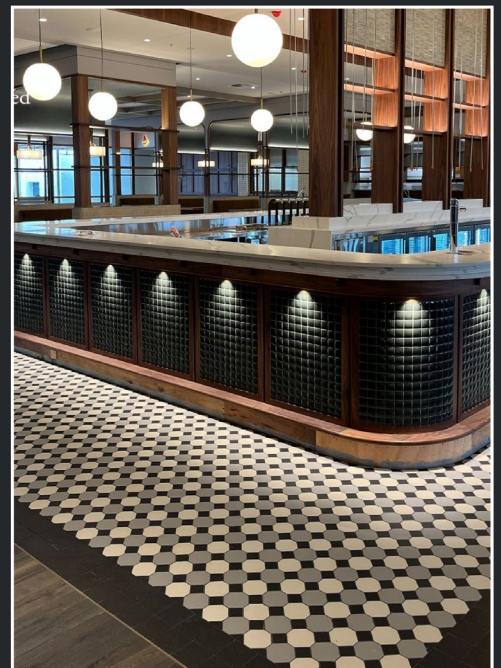
Simple tessellations are relatively easier to construct and understand. The regularity of the shapes simplifies the tessellation process.

#### 4. Common in nature:

Simple tessellations are often found in nature. For instance, the honeycomb structure created by bees is a natural example of hexagonal tessellation.

#### 5. Mathematical regularity:

Simple tessellations are closely tied to regular mathematical principles. The angles and sides of the tiles fit together seamlessly.





## Complex Tessellation:

### 1. Irregular shapes:

Complex tessellations involve irregular shapes that do not have equal sides or angles. These shapes can be more intricate and varied.

### 2. Non- repeating patterns:

The tiles in complex tessellations create patterns that may not necessarily repeat regularly. The arrangement can be more intricate and less predictable.

### 3. Artistic and creative:

Complex tessellations often involve a higher level of creativity and artistic expression. Artists and designers may use irregular shapes to create unique and visually interesting patterns.

### 4. Challenging to construct:

Constructing complex tessellations can be more challenging due to the irregularity of the shapes involved. Precision and careful arrangement are required.

### 5. Artistic applications:

Complex tessellations are commonly used in art and design for aesthetic purposes. Artists may use irregular shapes to create visually captivating and unique compositions.

### 6. Less common in nature:

While simple tessellations are frequently observed in nature, complex tessellations are less common. The irregularity of shapes may not align as naturally in the patterns observed in the natural world.





## Examples

Simple tessellation example: A classic example of simple tessellation is the regular hexagonal pattern found in honeycombs.

Complex tessellation example: Escher's artwork often features complex tessellations where irregular shapes interlock to form intricate and visually captivating patterns.





## Design & application

When designing for your required space whether it be indoors or outdoor the best type of installation is dependent according to the size you are working with. This is highly important as the size plays a major part in the selection process. When applying complex tessellation it is essential to have a significant amount of space as the repeat pattern needs to have enough room for the design to take place. When applying simple tessellation it is often better to place it in smaller areas as the pattern style does not require a big space to avail the beauty of simple tessellation.

Monetary wise simple tessellations cost less for installation as opposed to complex tessellation. This is based on the make up of tessellation as it consists of three components the pattern, a border and a filler. The more intricate design the more time, precision and accuracy is required.





In summary, simple tessellations involve regular shapes that create repeating patterns often found in nature and with clear mathematical regularity. Complex tessellations on the other hand involve irregular shapes, allowing for more creative and artistic expressions but often requiring a high level of complexity in construction. Both types of tessellations have unique applications and contribute to the fields of mathematics, art and design.





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